VMware vCenter AppSpeed User's Guide

AppSpeed 1.2

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About This Book

This book, the *VMware vCenter AppSpeed User's Guide*, describes the user interface for the VMware vCenter AppSpeed™ virtual machine and plug-in.

Intended Audience

This book is intended for IT administrators who use AppSpeed to monitor the performance, usage, and dependencies of multi-tier applications running across both virtual and physical infrastructure.

This document is written to support the VMware vCenter AppSpeed plug-in, running on a vSphere Server. vSphere Server is an upgrade from vCenter Server 2.5. All the procedures described in this guide are also relevant when the AppSpeed plug-in is running on a vCenter Server, however some of the user interface terminology and locations of user interface components might differ.

This document assumes a basic understanding of VMware management and the VMware vSphere™ Client.

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AppSpeed Overview

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VMware vCenter AppSpeed provides performance management and service-level reporting for applications running within virtual appliances. AppSpeed analyzes the traffic that flows between end users, Web applications, and back-end servers. This analysis provides visibility into multitier applications. The analysis enables you to rapidly identify performance problems that originate from inadequate resource allocation and application problems.

AppSpeed probes capture ingoing and outgoing traffic servers that are running on hosts on which the probes are deployed. This feature enables AppSpeed to monitor the real-time end user experience for all transaction requests, analyzing performance through all layers.

AppSpeed establishes baselines based on application behavior over time and compares real-time metrics to service-level targets. In addition, AppSpeed maintains historical monitoring data that you can use to analyze trends and for troubleshooting purposes. You can identify which component is responsible for a performance problem and identify the likely solution. You can also configure AppSpeed to generate real-time events in response to transaction-level performance and availability problems. Optionally, you can send email notifications when events are generated.

AppSpeed includes a wide range of predefined viewing options to facilitate the analysis of performance data. The predefined views incorporate different combinations of data, presented in tabular and graphical format. Different sets of views are available when you select a server object, an application object, or a transaction object.

Accessing the AppSpeed User Interface

You access AppSpeed from within the VMware vSphere Client.

The first time you access the user interface, AppSpeed prompts you to install the probes. See "Deploy an AppSpeed Probe" on page 28.

Access the AppSpeed user interface

1 Click **Home** > **Solutions and Applications** and click the **AppSpeed** icon.

   The namespace appears in the **Connect to** text box. If the displayed name is incorrect or is not in the list, type the correct namespace.

2 (Optional) If the **AppSpeed** icon does not appear, verify that the AppSpeed plug-in is enabled in the **Plug-ins** menu.

3 Click the tab for the required AppSpeed module, where you can perform the following tasks:

   - **Analysis**: View real-time and historical performance data.

   - **Topology Map**: View the location of a specific application, server, or transaction on your network, and to view the relationships between the monitored objects. The default map view focuses on applications, showing the connections between applications and the servers on which they operate.

   - **Administration**: Manage various administrative functions, including installing and deploying probes, configuring SSL keys and mail notification settings, adding or editing AppSpeed license keys, editing topology objects, and creating and viewing support information.

Viewing Performance Data

2

This chapter describes how to display performance data for applications, servers, and transactions in the Analysis module and outlines the types of data presented in each of the predefined views.

This chapter includes the following topics:

- "AppSpeed Views" on page 9
- "Viewing Summary Data for Applications and Servers" on page 13
- "Viewing Application Data" on page 14
- "Viewing Server Data" on page 15
- "Viewing Transaction Data" on page 15
- "Performance Indicators" on page 16

AppSpeed Views

The AppSpeed Analysis module has several predefined views that enable you to view different cross-sections of performance data in a variety of ways.

For details on the indicators displayed according to a predefined view, see "Performance Indicators" on page 16.

Select an Object

Objects are applications, servers and transactions. The AppSpeed Inventory tree lists the applications and servers detected on the network. When you select an application in the Inventory tree, you can view its related transactions on the **Transactions** tab of the Analysis page or States page.

If you select **Applications and Servers** (the root directory) in the Inventory tree, the information displayed reflects the overall status of all of the applications and servers. To display information for a specific object, select the relevant application or server in the Inventory tree.

Select a View

The available views vary according to the type of object selected in the AppSpeed Inventory tree. When you select the Analysis or States pages, data appears as a graph and as a table.

Select an Analysis view

On the Analysis page, select the name of the view from the **Select Analysis Views** menu in the View Settings bar.

Define the Time Frame and Format for Data Collection

You can define the time frame for which performance data is displayed. You can also define that the data output be displayed in a specific time format, such as daily or hourly.

Define the Time Frame

You can specify the start and end times and dates, or you can select a predefined time frame, such as the previous month.

Define a specific date range

1   From the **Select Time Frame** menu in the view settings bar, select **Manual**.

2   Click the arrow in either the **To** or **From** menu to specify the start and end dates and time, and click **OK**.

The time frame of the data displayed is adjusted accordingly.

Define a time frame

From the **Select Time Frame** menu in the view settings bar, select the predefined time frame.

For example, to view performance data for the past 12 hours, select **Last 12 Hours**.

Set the Time Format

You can set the time format of the displayed data, meaning that you can view the data according to specific units of time, such as by day, hour, or minute. For example, an hourly time format graphs the data across the hours of a day (0 to 23). The specific units of time that are displayed in the menu are dependent on the data time frame that you specified. If data is not available for a selected time unit, AppSpeed sets the largest unit available for the selected time frame.

Set the time format

From the **By** menu in the view settings bar, select the time format.

View Real-Time Metrics

In the **Info Panel**, you can view real-time metrics for selected objects. The type of information displayed varies according to the object type. The data displayed reflects the performance for the past five minutes.

In the Applications and Servers view, the **Info Panel** displays the throughput and the level of Service Level Agreement (SLA) compliance. It can also include information about the number of applications, servers, or transactions and the selected object's latency and error states.

Show or hide the Info Panel

1   To display the **Info Panel**, click **Show Info Panel** in the upper-right corner of the main display area.

2   To hide the **Info Panel**, click **Hide Info Panel** in the upper-right corner of the main display area.

View Data with Performance Tables

One way to view performance data is in tables. The content of the tables depends on the selected view and whether the object type is an application or server.

Each table appears on a separate tab. A row appears at the bottom of every tab, showing summary data for the object selected in the Inventory tree. The data summarizes the entire timeframe that you specified. This row does not change between tabs.

The following icons appear adjacent to an object name, to indicate if the item is selected in the table:

	The item is selected.
	The item is not selected.

You can perform a variety of actions on the tabular display data:

- View data on the chart for specific applications, servers, or transactions.

- Navigate a specific application, server, or transaction to view additional data.

- Sort data in the table and rearrange the order of the columns.

- Search for specific applications or servers.

- Highlight the data for a specific object on the corresponding graph, by selecting its row in the table.

- Export the data into a CSV file.

Sort Tabular Data

You can sort tabular data according to a specific parameter.

Sort data

1   Click the column header of the data to sort.

2   Click again to reverse the sort order.

3   (Optional) Drag a column header to a new position to alter the order of the columns.

Search for Objects in a Table

You can search for objects (servers, applications, and transactions) in a table. The search criteria are applied to all cells in the displayed table.

Search for an object

1   In the tabular display pane, click the magnifying glass icon to show or hide the search bar.

2   In the **Search** text box, type your search criteria and click the magnifying glass icon.

    The objects that match the search criteria are highlighted in the table.

3   Click the Up and Down arrows to navigate between the results.

4   (Optional) Click **Clear** to cancel the search and clear highlighting from table entries.

Performance Charts and Graphs

The graphs and charts displayed depend on the selected view and object type. Charts or graphs are available on the Analysis, Thresholds, and States pages.

You can perform a variety of actions from the graphic display pane.

- Show or hide latency standard deviation indicators on the graph.

- Export the graph or the graph data.

Chart and Graph Types

Table 2-1 describes the graphs and charts that are available.

Table 2-1. Charts and Graph Types

Chart/Graph Type	Description
Usage vs. Latency	Compares the latency and usage behaviors for the selected object type.
Latency	Displays the latency behavior during a selected period of time.
Usage	Reports the use during the selected time frame for the objects selected in the display area.
Latency Breakdown	Displays a chart that reports the end-to-end latency analysis for the selected application or transaction. The content of this chart is not linked to your selections in the tabular display area.

Table 2-1. Charts and Graph Types (Continued)

Chart/Graph Type	Description
Latency vs. Baseline	Shows the average usage and latency for either applications or servers, with the corresponding baseline. This information is available in the Applications and Servers views only.
Throughput Breakdown of Servers	Reports the analysis of throughput for servers for the selected application.
Availability	Reports trends in error behavior for the selected time frame and selected object type.

For details on the performance indicators shown in each of the charts and graphs, see "Performance Indicators" on page 16.

Filter the Graphic Display

You can view data for specific objects in the chart or graph.

To filter the data, select or deselect the check boxes in the table in the lower portion of the data display pane.

NOTE   You cannot filter the Latency Breakdown and Throughput Breakdown graphs.

Display or Hide Latency Standard Deviation Indicators

Latency indicators illustrate the standard deviation for latency on graphs in some views. By default, this feature is hidden.

Display or hide latency standard deviation indicators

In the tabular display pane, click the graph icon to display or hide latency standard deviation indicators.

You can view the standard deviation values in a pop-up window by placing your pointer on a deviation indicator.

Export Performance Data

You can save performance data in various formats for viewing and analysis in external applications.

Export Table Data

You can export performance data into a comma-separated value (CSV) file.

Export the table data

1   In the tabular display pane, click the CSV icon.

2   Name the file, ensuring that the CSV extension is included in the file name.

3   Select the location to save the file and click **Save**.

Export a Graph as an Image

You can save the currently displayed graph as an image (PNG).

Export the graph as an image

1   In the graph display pane, click the PNG icon.

2   Name the file, ensuring that the PNG extension is included in the file name.

3   Select the location to save the file and click **Save**.

Export the graph data as a CSV file

1   In the graph display pane, click the CSV icon.

2   Name the file, ensuring that the CSV extension is included in the file name.

3   Select the location in which you want to save the file, and click **Save**.

Viewing Summary Data for Applications and Servers

You can view summary performance data for all of the applications and servers on the network in one of several predefined views.

View summary data for the entire network

1   In the AppSpeed Inventory tree, select **Applications and Servers**, which is the root node.

The data shows the performance of all the applications and servers monitored by AppSpeed, according to the Applications: Baseline Comparison view.

2   To view the total number of servers and applications, and the throughput and level of SLA compliance, click the Analysis page to view the Info Panel.

The data displayed reflects the performance for the last five minutes.

3   (Optional) Select an alternative view from the **Select Analysis Views** menu.

4   (Optional) To view summary data in the graphic display pane for a limited number of applications or servers, select the check boxes for the objects for which to include data.

View States

You can view the real-time values of performance indicators for all applications or for the transactions of a selected application based on their performance in the last 10 seconds.

View real-time state data

1   In the Inventory tree, select **Applications and Servers** or a specific application.

2   On the page selection bar, click **States**.

State-Related Parameters

The tabular display pane of the States page lists the following state-related parameters:

- **State**: Current state of the application or transaction.

- **Latency state**: SLA state for latency.

- **Error state**: SLA state for errors.

- **Average latency**: Average measured time between the start of the client request to the end of the server reply in the last ten seconds.

- **Average errors**: Average rate of errors in the last ten seconds.

- **Average hits**: Average number of hits per second in the last ten seconds.

- **Since**: Time when the state change occurred.

View Unmapped Traffic

You can view the unmapped servers and transactions detected on the network. Unmapped objects are not yet mapped to specific applications. The number of unmapped objects typically decreases as AppSpeed maps the environment.

To view unmapped traffic on HTTP sites that incorporate SSL protection, you must configure the SSL keys for each endpoint where AppSpeed detects SSL traffic. See "Managing SSL Keys" on page 29.

View unmapped traffic

1   In the Inventory tree, select **Applications and Servers**.

2   On the page selection bar, click **Unmapped Traffic**.

3   View the status information for the unmapped traffic.

- **Server**: Name of the server (Available on **Servers** tab only).

- **Name**: Name of transaction (Available on **Transactions** tab only).

- **Endpoint**: IP address and ports used by the server (Available on **Servers** tab only).

- **Latency**: Average and standard deviation (STDEV) latency rates for the server or transaction.

- **Hits**: Total number of hits in the specified timeframe for the server or transaction, and rate of hits per second.

- **Throughput**: Total throughput in the specified timeframe for the server or transaction, and the average throughput.

- **Errors**: Average rate of errors, as a percentage, for the server or transaction.

Viewing Application Data

You can view information on a specific application, such as its properties, threshold settings, real-time states, and generated events.

Display detailed data for a single application

1   In the Inventory tree, select an application.

The data display pane displays data based on the Usage vs. Latency view.

2   (Optional) Select a view from the **Select Analysis Views** menu to change the application view.

View Application States

You can view real-time metrics for the selected application, including throughput, hits, latency, errors, and SLA levels in the Analysis page info panel. The data displayed reflects the performance for the last five minutes.

Table 2-2 describes the icons used to represent the application states.

Table 2-2. State Icons

Icon	Description
	The application's performance complies with set SLA and latency thresholds.
	The application is in Warning state.
	The application does not comply with the terms of the SLA.
	The application is unavailable.

View Application Properties

You can view the general properties of the selected application, including its name and application roots.

View the application properties

On the page selection bar, click **Properties**.

Edit Application Properties

You can edit the name of an application.

To edit other application properties, see "Manually Editing Topology Maps" on page 23.

Edit the application name

1   On the page selection bar, click **Properties**.

2   Edit the text in the **Name** text box and click **Update**.

Viewing Server Data

You can view performance analysis data for a server and its related applications and dependent servers, including charts and tables.

Display detailed data for a single server

In the Inventory tree, select the server for which to display data.

The data display pane displays data based on the Usage vs. Latency view. You can select an alternative view from the **Select Analysis Views** menu.

Viewing Transaction Data

You can view performance analysis data for transactions.

View Transaction Data Information

The transaction data that you can view, includes its analysis, properties and generated events. If the name of a transaction has been truncated, you can view the full name of the transaction on the Properties page.

Display transaction information

1   In the Inventory tree, select the application for which you want to view a transaction.

2   In the tabular data pane, click the **Transactions** tab.

3   Double-click the transaction to view the data.

    The data display pane displays data based on the Usage vs. Latency view. You can select an alternative view from the **Select Analysis Views** menu.

4   To view information about the transaction, such as its full name, transaction roots or the application to which it belongs, double-click the transaction and click **Properties** on the page selection bar.

View Full Transaction Name

The full name of a transaction is often truncated because of space restrictions in the name field. You can display the full name on the transaction's Properties page.

View full transaction names

1   Double-click a transaction.

2   Click **Properties** on the page selection bar.

    The full name appears in the **Description** field. For example, a URL appears for an HTTP transaction, and a database query appears for a database transaction.

Performance Indicators

Table 2-3 lists the performance indicators that AppSpeed monitors. The performance indicators displayed vary according to the selected view.

Table 2-3. AppSpeed Performance Indicators

Performance Indicator	Description
Average Latency	Measured time between the start of the client request to the end of the server reply, averaged across all hits in the specified time frame. A greater value means a slower server response.
Average Reply Size	Average size, in bytes, of a single server reply, averaged across all hits in the specified time frame.
Average Throughput	Average number of reply bytes per second in the specified time frame.
Error Percentage	Percentage of error hits as a portion of the total hits in the specified time frame.
Execution Time	Sum of all latencies in the specified time frame. This value reflects the total amount of time of all server replies in the specified time frame.
Hit Rate	Average number of hits per second in the specified time frame.
Latency Baseline	Average latency of all hits since the AppSpeed Server started running.
Latency Breakdown	■ **Application**: The latency measured from the time the server receives the first packet of the request until it starts to transmit the reply. ■ **Infrastructure**: The latency measured from the time the server starts transmitting the reply until fully replying to the client's request. ■ **Network (RTT)**: The average round-trip time, without failures, from client to server. ■ **Network Overhead**: The cost of packet retransmissions, errors, and drops.
Latency % of Baseline	Percentage of latency above or below the baseline.
Latency STDEV	The standard deviation of the latency of all of the hits in the specified time frame.
Max. Latency	The latency of the slowest hit in the specified time frame.
SLA percentage	The percentage of hits that were not errors and that had latency within SLA levels.
Total Errors	The total number of hits identified as errors in the specified time frame.
Total Hits	The total number of hits in the specified time frame.
Total Throughput	The total number of reply bytes in the specified time frame.

Indicators by View

The type of object selected in the AppSpeed Inventory tree determines the available views and the performance indicators included in each view.

Performance Indicators in Applications and Servers Views

Table 2-4 lists the performance indicators included in the views available when **Applications and Servers** is selected on the AppSpeed Inventory tree.

NOTE   A plus sign (+) indicates that the performance indicator appears in the view.

Table 2-4. Performance Indicators in Applications and Servers Views

Performance Indicator	View Name					
	Applications: Baseline Comparison	Applications: Usage Over Time	Servers: Baseline Comparison	Servers: Least Used	Servers to Applications	Applications to Servers
Average Latency	+	+	+		+	+
Latency Baseline	+		+			
Latency STDEV	+		+		+	+
Hit Rate	+	+	+	+	+	+
Total Hits	+	+	+	+	+	+
Average Throughput	+	+	+	+	+	+
Total Throughput		+		+	+	+
Average Reply size		+		+		
Endpoint					+	+
Execution Time	+		+			
Error Percentage		+		+	+	+

Performance Indicators in Application Views

Table 2-5 lists the performance indicators included in the views that are available when an application is selected in the AppSpeed Inventory tree.

NOTE   A plus sign (+) indicates that the performance indicator appears in the view.

Table 2-5. Performance Indicators in Application Views

Perf. Indicator	View Name									
	Usage vs. Latency	Slowest Transact.	Latency Over Time	Latency Breakdown	Latency vs. Baseline	Most Used Transact.	Usage Over Time	Throughput Breakdown of Servers	Latency Distrib. Between Servers	Availability Over Time
Average Latency	+	+	+	+	+	+	+	+	+	+
Latency STDEV	+	+	+	+	+			+	+	
Max Latency	+	+	+	+					+	
Latency % of Baseline					+					
Latency Baseline					+					
Hit Rate	+					+	+	+		+

Table 2-5. Performance Indicators in Application Views (Continued)

Perf. Indicator	Usage vs. Latency	Slowest Transact.	Latency Over Time	Latency Breakdown	Latency vs. Baseline	Most Used Transact.	Usage Over Time	Throughput Breakdown of Servers	Latency Distrib. Between Servers	Availability Over Time
Total Hits	+	+	+		+	+	+	+	+	+
Average Throughput	+	+				+	+	+		+
Total Throughput						+	+	+		
Total Errors										+
Error Percentage			+			+	+	+	+	+
Execution Time		+	+		+				+	
Average Reply Size	+	+	+		+		+		+	+
Application				+						
Infrastructure				+						
Network (RTT)				+						
Network Overhead				+						

Performance Indicators in Server Views

Table 2-6 lists the performance indicators included in the views that are available when a server is selected in the AppSpeed Inventory tree.

NOTE   A plus sign (+) indicates that the performance indicator appears in the view.

Table 2-6. Performance Indicators in Server Views

Performance Indicator	Usage vs. Latency	Applications Latency	Latency Breakdown	Applications Usage	Applications Availability
Average Latency	+	+	+	+	+
Latency STDEV	+	+	+		
Max Latency	+	+	+		
Hit Rate	+			+	+
Total Hits	+	+		+	+
Average Throughput	+			+	+
Total Throughput				+	+
Total Errors					+
Error Percentage		+		+	+
Execution Time		+			
Average Reply Size	+	+		+	+
Application			+		
Infrastructure			+		

Table 2-6. Performance Indicators in Server Views (Continued)

Performance Indicator	View Name				
	Usage vs. Latency	Applications Latency	Latency Breakdown	Applications Usage	Applications Availability
Network (RTT)			+		
Network Overhead			+		

Performance Indicators in Transaction Views

Table 2-7 lists the performance indicators included in the views that are available when a transaction is selected in the AppSpeed Inventory tree.

NOTE   A plus sign (+) indicates that the performance indicator appears in the view.

Table 2-7. Performance Indicators in Transaction Views

Performance Indicator	View Name				
	Usage vs. Latency	Latency Over Time	Latency Breakdown	Usage Over Time	Availability Over Time
Average Latency	+	+	+	+	+
Latency STDEV	+	+	+		
Max Latency	+	+	+		
Hit Rate	+			+	+
Total Hits	+	+		+	+
Average Throughput	+			+	+
Total Throughput				+	
Total Errors					+
Error Percentage		+		+	+
Execution Time		+			
Average Reply Size	+	+		+	+
Application			+		
Infrastructure			+		
Network (RTT)			+		
Network Overhead			+		

Working with the Topology Map 3

The topology map shows the relationships between the applications and servers detected on the network, and the dependencies between applications.

This chapter includes the following topics:

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-
-
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Displaying the Topology Map

You can view the default map by selecting the Topology Map module. Alternatively, while viewing application or server data in the Analysis module, you can directly access the map.

Display the topology map

Click the **Topology Map** tab.

By default, the map view focuses on applications.

Display the topology map from an application or server view

Depending on whether an application or a server is selected in the Inventory tree, click the **Find Application on Topology Map** or **Find Server on Topology Map** link in the **Info Panel**.

Either the **Application Focused** view or the **Server Focused** view is displayed, depending on the selected object. The selected object is centered on the topology map.

Select a Map View

You can display the Topology map with the focus on an application or on a server.

Select a view

On the map toolbar, select one of the following options:

- **Application Focused**: Applications are centered and lines are drawn from each application to its servers.
- **Server Focused**: Servers are centered and lines are drawn from each server to its applications.

Topology Map Legend

The topology map includes application and server objects.

The following object types are represented on the topology map:

🖼	Application
🗄	Server

Hold your pointer over an object to display its application type or server IP address.

The SLA state of each application is indicated by an additional icon:

⚠	Warning
🔴	Above SLA
❌	Not available
🖼	State is OK

Lines indicate the relationships between applications and servers, based on the selected map view. Dependencies are indicated by dashed orange arrows.

View Dependencies

You can view the dependencies between objects on the map. The type of relationships displayed depends on the object at the center of the map. Dependencies are indicated by dashed orange arrows.

- When the focus is on an application, showing the dependencies displays the connections between the different applications.

- When the focus is on a server, showing the dependencies displays the connections between the different servers.

Display or hide object dependencies

Select or deselect the **Show Dependencies** check box, as required.

Overview Map Window

The Overview Map window displays a miniature view of the map area. You can select and zoom in on a specific area on the map, or adjust the overall scale of the map by zooming in and out.

View the topology map by using the Overview Map window

1   Select the **Show Overview map** check box.

    To hide the Overview Map window, deselect the **Show Overview Map** check box.

2   To focus on a specific area, select the area and drag the selection box around the relevant area in the miniature map.

3   Click the plus (+) or minus (-) icons to zoom in or out on the map scale bar.

4   To adjust the zoom to fit the content, click 🔳 on the map scale bar.

Analyze an Object

You can select an object on the topology map and view its details on the Analysis page.

Display the analysis information for a map object

Select the object on the topology map and click 🔗 **Analyze**.

The Analysis page for the selected application or server appears.

Locate an Object on the Map

You can search for an object on the topology map.

Locate an object on the map

Type the name of the object (or part of the name) in the text box and click the magnifying glass icon.

The first matching object that is detected is selected on the map.

To locate the next object that matches the name, click **Next**.

Manually Editing Topology Maps

AppSpeed maps servers and applications topology from the network traffic monitored on the deployed hosts. In some cases, you might want to change the topology, for example, to merge two separately mapped applications or to view a single mapped application as two separate ones, depending on the servers it runs on.

You might also want to remove objects because they are obsolete or less relevant.

You can split, merge, remap, or delete applications, according to your requirements.

If you split, merge, or remap an application, the historical monitoring and configuration data of the servers or application roots, such as thresholds, is reset.

Split an Application

An application can be split so that it can be monitored as two separate applications. For example, in a server-based scenario you might want to split the monitoring process of an application that is running on a staging server and on a production server, so that they are monitored as two separate applications.

An application is split according to either the server on which it is running, or on its application roots. An application root is a transaction (usually a database or a domain) within the application that all subordinate transactions have in common. Each application can have multiple roots. For example, in an application root-based scenario, you might want to monitor as two separate applications, two databases that were originally mapped under a single application.The roots are visible on the **Properties** tab for the application.

Split an application

1   Click the **Administration** tab, and in the Management Tools pane click **Topology Management**.

2   Click **Manage Applications**.

3   Select the required application and click **Split**.

    You can only split a single application.

4   In the confirmation dialog box, select the servers or application roots to split from the application.

5   Type a name for the new application, and click **Split**.

Merge Applications

You can merge two or more applications so that you can monitor them as a single application. For example, you might want to monitor two individual database applications as a single application.

Merge applications

1   Click the **Administration** tab, and in the Management Tools pane click **Topology Management**.

2   Click **Manage Applications**.

3   Select two or more applications to merge and click **Merge**.

4   Select the base application into which you want to merge other applications.

   This base application retains all of its historical monitoring data and configuration.

5   (Optional) Name the new merged objects application.

6   Click **Merge**.

Remap Applications

Remapping an application is useful if the application structure has significantly changed. Remapping an application it deletes it. However, if the application is still monitored, it is remapped according to the traffic pattern.

Remap an application

1   Click the **Administration** tab, and in the Management Tools pane click **Topology Management**.

2   Click **Manage Applications**.

3   Select the required application and click **Remap**.

Delete Applications

You might want to delete an application, for example, if it is obsolete, or if you need to free resources for scalability reasons such as to enable another server to be mapped.

Delete an application

1   Click the **Administration** tab, and in the Management Tools pane click **Topology Management**.

2   Click **Manage Applications**.

3   Select the applications to be deleted and click **Delete**.

   Deleted applications are moved to the **Deleted Objects** tab and are no longer monitored.

Delete Servers

You might want to delete a server, for example, if it is obsolete, or if you need to free resources for scalability reasons such as to enable another server to be mapped. Multiple servers can be deleted simultaneously.

Delete a server

1   Click the **Administration** tab, and in the Management Tools pane click **Topology Management**.

2   Click **Manage Applications**.

3   Select the server to delete and click **Delete**.

   The deleted server is moved to the **Deleted Objects** tab and is no longer monitored.

Restore Deleted Applications and Servers

You can restore a deleted server or application object.

When you restore a deleted server or application object, monitoring data and certain application structures are reset.

Restore a deleted object

1   Click the **Administration** tab, and in the Management Tools pane click **Topology Management**.

2   Click **Deleted Objects**.

3   Select the required application or server and click **Restore**.

   You can restore only a single application or server at a time.

Scalability

AppSpeed is a real-time application performance tool that collects, analyzes, and stores substantial volumes of data per second. The following parameters affect AppSpeed's performance:

- The number of probes deployed

- The number of monitored applications

- The number of monitored servers

- The number of transactions

- The volume of monitored network traffic

The two main factors affecting scalability in AppSpeed are the number of overall monitored objects and the number of transactions that are being monitored. AppSpeed reduces the number of transactions for each application as additional applications are mapped. This number can be reduced to as few as 50 transactions for each application. AppSpeed stops detecting new servers after the number of monitored servers exceeds 500, or the number of IP addresses and ports in the monitored network exceeds 3000. It also stops mapping new applications if the number of monitored applications exceeds 100.

AppSpeed Administration

4

You can perform various administrative functions in AppSpeed, including installing and deploying probes, configuring SSL keys and mail notification settings, adding or editing AppSpeed license keys, editing topology objects, and creating and viewing support information.

This chapter includes the following topics:

- "Managing Probes" on page 27
- "Managing SSL Keys" on page 29
- "Managing AppSpeed Licenses" on page 31
- "Accessing Technical Support" on page 32

Managing Probes

Before the monitoring process can begin, you must install at least one AppSpeed probe on one or more hosts. Each probe can monitor up to three vSwitches. You can install more than one probe on the same host to monitor additional vSwitches.

You initially configure the probe settings, including the management network, storage device, and specific vSwitches to monitor, as part of the probe installation process. After that, you can add and remove probes as needed.

To configure the AppSpeed probe to monitor a vNetwork distributed switch, see the *VMware vCenter AppSpeed Installation Guide*.

View Probe Information

You can view the current probe configuration details.

View probe information

Click the **Administration** tab, and in the Management Tools pane click **Probes Management**.

The Probes Management window displays, in a hierarchical format, the existing host clusters and hosts and the probes installed on them.

Deploy an AppSpeed Probe

You can install a probe on one host at a time, or you can install a probe on multiple hosts at the same time.

When you install a probe in AppSpeed, distributed vSwitches do not appear in the Probe Installation window. To monitor these switches, you must manually configure the AppSpeed probe. See the *VMware vCenter AppSpeed Installation Guide*.

Install a probe

1   In the Probes Management window, select the check boxes for one or more hosts or clusters on which to install a probe and click the **Install Probes** button.

   A probe is installed on each selected host, regardless of whether another probe is already installed on the host.

   When you select the check box for a cluster, the check boxes for each host that it contains are selected. Similarly, when you select a host, any probes already installed on it are selected.

   The Probe Installation window displays a separate entry for each host that you select. Each entry appears in a separate pane.

2   (Optional) Configure the probe for each host entry.

   a   Type the name of the probe in the **Probe Name** text box.

      If you do not specify a name, the AppSpeed Server assigns a default name.

   b   From the **Storage** menu, select the storage device to which the probe connects.

   c   From the **Management Network** menu, select the network to use to manage the probes.

      Select up to three monitoring vSwitches. The vSwitches sniff traffic on the configured management network. By default, the first three available vSwitches are selected.

      The probe also connects to the management network you specified, but it does not monitor the network.

3   (Optional) To add an additional probe to a host, click **Install another probe on this host** at the bottom of the host entry and configure the probe as described in Step 2.

4   When you finish adding host-probe combinations, click the **Install Probes** button.

5   Review the installation information and click **OK**.

6   (Optional) Click **Back** to return to change any of the settings.

The installation progress is indicated in the Probe Status column in the Probes Management window.

Upon completion, you can see the new probe in the vSphere Client, by navigating to **Home > Inventory > VMs and Templates**. The probe is added to the `<namespace> Probes` folder. The probe is powered on and set up.

If you used an AppSpeed Server snapshot to optimize multiple probe deployment, delete the snapshot after you finish deploying all the probes

Power Probes On or Off

You can power probes on or off from the Probes Management window.

Power probes on or off

In the Probes Management window, select the check boxes for one or more probes, and click **Power On** or **Power Off**.

Delete Probes

If you do not want to monitor the traffic on a specific host, you can remove the probes from that host.

Delete probes from hosts

1   In the Probes Management window, select the check boxes for one or more probes on one or multiple hosts, and click **Delete Probe**.

2   Click **OK** to confirm.

The probe is removed from the selected hosts only.

Managing SSL Keys

For AppSpeed to monitor traffic on HTTPS sites that incorporate SSL protection, you must configure the SSL keys for each endpoint, the IP address and port pair, where AppSpeed detects SSL traffic. AppSpeed supports Apache, Microsoft IIS 6.0, and Microsoft IIS 7.0 SSL keys.

AppSpeed supports configuring and monitoring SSL keys for HTTPS sites only.

View SSL key information

1   Click the **Administration** tab, and in the Management Tools pane, click **SSL Management**.

2   View the secure site endpoints for which AppSpeed cannot monitor traffic without a key.

- The Pending SSL Endpoints table lists the endpoints for which valid SSL keys are required, including their IP addresses and ports. AppSpeed identifies the SSL endpoints for which keys do not exist.

- The Monitored SSL Endpoints table lists the endpoints for which valid keys exist in AppSpeed, including the respective server name, where available, and IP address and ports. AppSpeed monitors traffic on these endpoints.

Add an SSL Key

You can assign a key to a pending endpoint to enable AppSpeed to actively monitor its traffic.

Add an SSL key

1   In the SSL Management window, select the check boxes for the endpoints in the SSL Pending Endpoints table and click **Add/Update SSL key**.

2   Browse to and open the key file.

The key is assigned to the selected endpoints. The endpoint moves from the SSL Pending Endpoints table to the Monitored Endpoints table.

Update an SSL Key

You can update the SSL key assigned to an endpoint, for example, to replace an older key with a new one.

Update an SSL key

1   In the SSL Management window, select the check boxes for the endpoints in the Monitored Endpoints table and click **Add/Update SSL key**.

2   Browse to and open the new key file.

The new key replaces the key previously assigned to the selected endpoints.

Extract SSL Files

You can extract the SSL files from the Web server to obtain the SSL keys. The procedure varies according to the type of Web server.

Extract SSL Files from an Apache Server

You can extract the SSL files from an Apache server.

Extract SSL files from an Apache Server

1 In the Apache conf directory, open the `http.conf` file. The filename is either `/etc/httpd/conf.d/ssl.conf` or `/etc/httpd/conf/httpd.conf`.

2 Locate the `SSLCertificateKeyFile` command on the SSL site.

3 Save a copy of the file that appears under `SSLCertificateKeyFile as [cluster].key` and transfer it to the vSphere Client machine.

You can select and upload the key file to the AppSpeed Server (see "Add an SSL Key" on page 29).

Extract SSL Files from a Microsoft IIS 6.0 Server

You extract the SSL files from a Microsoft IIS 6.0 server by exporting the IIS key file.

Export the IIS key file

1 Select **Start Programs > Administrative Tools > Internet Information System (IIS) Manager**.

2 Expand the COMPUTERNAME (local computer) tree in the left pan, and expand the Web Site tree.

3 Right-click **Default Web Site** and select **Properties**.

4 Select the **Directory Security** tab and click **Server Certificate**.

5 Select **Next**, select **Export the current certificate to a PFX file**, and select **Next** again.

6 Select a file for the exported certificate and key to be written and select **Next**.

7 Enter the password with which the key is to be encrypted.

During the export process, a password is requested to protect the key. If a password is assigned, note this password. The password is required when you import the key into AppSpeed.

8 Reenter the password in the **Confirm Password** text box.

9 Select **Finish**.

Transfer the PFX file to the vSphere Client machine and upload it to the AppSpeed Server (see "Add an SSL Key" on page 29).

Extract SSL Files from a Microsoft IIS 7.0 Server

You extract the SSL files from a Microsoft IIS 7.0 server by exporting the IIS 7.0 key file.

Export the IIS 7.0 key file

1 Select **Start > Programs > Administrative Tools > Internet Information System (IIS) Manager**.

2 Expand the COMPUTERNAME (local computer) tree in the left pane and double-click the **Server Certificates** icon in the middle pane.

3 Right-click the certificate and select **Export**.

A PFX file is created.

During the export process, a password is requested to protect the key. If a password is assigned, note this password. The password is required when you import the key into AppSpeed.

Transfer the PFX file to the vSphere Client machine and upload it to the AppSpeed Server (see "Add an SSL Key" on page 29).

Managing AppSpeed Licenses

You must have an AppSpeed license to monitor traffic. If you have multiple AppSpeed Servers, each server requires a license.

View existing licenses

Click the **Administration** tab, and in the Management Tools pane click **Licensing**.

The total number of licensed processors, all licenses combined, and the number of monitored processors are displayed at the top of the page.

The table displays details for existing licenses. The Processors column in the table lists the maximum number of physical chips on physical hosts that have virtual machines monitored by AppSpeed.

Expired licenses appear in red.

Add a License

You can add additional licenses, for example, to implement AppSpeed monitoring on additional servers that are not covered by existing licenses.

Add a license

1   On the License page, click **Add License**.

2   Type the license key that VMware provides in the text box and click **OK**.

3   (Optional) If the license key string is invalid, an error message appears immediately above the license key list. Check the license key and try again.

View License Details

You can view the details of an existing license, including the permitted number of servers, the date the license was issued, the date the license is scheduled to expire, and the number of days left until that expiry date.

View the license details

1   On the License page, select a license key and click **View License**.

2   Click **OK** to return to the License page.

Remove a License

You can remove an existing AppSpeed license.

If you remove a valid license before its expiry, the number of permitted processors decreases accordingly

Remove a license

1   On the License page, select a license key and click **Remove License**.

2   When you are prompted to confirm the deletion, click **OK**.

The license is removed.

Accessing Technical Support

The Support view under Management Tools displays snapshots and an event log that you can download and send to VMware technical support to enable swifter resolutions to problems you encounter with AppSpeed.

Event Log

The event log is a text file that includes information that can be used to analyze problems.

Download the event log

Click the **Click here** link.

The event log is downloaded.

Snapshots

An AppSpeed snapshot is a collection of logs, configuration files, and internal databases. You have the following options when you set up a snapshot:

■ Default

When you select **Default**, the snapshot collects all of the logs, configuration, and server databases of the AppSpeed Server and its probes for the previous four days.

■ Custom

When you select **Custom**, you can choose to collect the following types of information:

■ Server only, which is a snapshot of the server excluding probes.

■ Commands only, which includes server commands but excludes probe data, logs, and database data.

■ Time delineated, which allows you to select a period of time in hours.

Event Management

You can monitor Service Level Agreement (SLA) compliance based on the performance of applications and transactions. AppSpeed monitors these latency and error thresholds for transactions. When a threshold is exceeded for a sustained period, AppSpeed generates an event.

You can manually monitor events or you can configure AppSpeed to send email notifications whenever an event is generated.

This chapter includes the following topics:

- "SLA States" on page 33
- "Configuring SLA Thresholds" on page 33
- "Configuring Email Notifications" on page 36
- "Viewing Events" on page 37

SLA States

AppSpeed uses state changes to generate events. The state of a transaction is based on its compliance to the defined latency and error thresholds.

The state of an application reflects the worst state of any of its transactions. For example, if the state of all the transactions is OK, the state of the application is OK. If the state of any transaction is Not Available, the application state is Not Available.

You can view the real-time states for all applications or for the transactions of a selected application. See "View States" on page 13

Configuring SLA Thresholds

You can define the levels at which state changes occur in response to unsatisfactory performance as measured by latency and the percentage of errors. You configure thresholds for each transaction.

When a performance level exceeds a defined threshold for a sustained period, a change in state occurs. Specific thresholds are defined for each state based on the degree of an application's compliance with or deviation from target SLA levels. The transition between states occurs according to deviation from the thresholds defined for warning, SLA violation, and unavailable states for the given transaction.

You can enable or disable performance monitoring for each application or for each transaction. See "Enable or Disable SLA Monitoring of Transactions" on page 35.

View Thresholds and Monitoring Settings

You can view the thresholds and SLA monitoring settings.

View threshold and monitoring settings

1   In an application view, click **Threshold Settings** on the page selection bar.

2   If SLA Monitoring is enabled, you can view the monitored transactions.

A separate entry appears for each transaction, including:

- **Modified**: If a change has been made in the settings for the transaction but not applied, a flag icon appears.

- **Name**: The name of the transaction and an icon indicating its state. Separate rows are displayed for **Latency** ⬛ and **Errors** ◈, immediately below each transaction name.

- **Monitor**: An On or Off icon indicates whether AppSpeed is monitoring thresholds and generating events for the transaction.

- **Warning**: The threshold for the respective warning state, if specified.

- **SLA**: The threshold for the respective SLA violation state, if specified.

- **Unavailable**: The threshold for the respective unavailable state, if specified.

- **Average**: The average performance level for the selected time frame.

- **Updated**: The date and time of the last threshold settings update.

SLA Monitoring

You can enable or disable SLA monitoring for each application or for each transaction. When disabled, thresholds are not monitored and events are not generated for state changes.

Enable or Disable SLA Monitoring of an Application

If you enable SLA monitoring for an application, monitoring is enabled for the application and for all of its transactions. If you disable SLA monitoring, you cannot set SLA thresholds for its transactions. You can configure AppSpeed to send email notifications regarding state changes (see "Configuring Email Notifications" on page 36.)

Enable SLA monitoring for an application

1   In the Threshold Settings page for the application, select **SLA Monitoring** > **Enabled**.

2   From the **Sensitivity** menu, select the sensitivity of state changes in response to detected deviations in performance levels, based on the number of hits and their persistence over time.

- **High**: Trigger a state change within a minute of detecting the onset of deviations.

- **Medium**: Trigger a state change after detecting the onset of deviations that persist for 5 minutes or longer.

- **Low**: Trigger a state change after detecting the onset of deviations that persist for 30 minutes or longer.

3   (Optional) Click **Go to Mail Notification Settings** to configure AppSpeed to send email notifications regarding state changes.

Disable SLA monitoring for an application

In the Threshold Settings page for the application, select **SLA Monitoring Disabled**.

Enable or Disable SLA Monitoring of Transactions

You can enable or disable SLA monitoring for specific transactions. To monitor a transaction, SLA monitoring must be enabled for the application to which it belongs.

Disabling SLA monitoring of a transaction does not remove any saved threshold settings, however the transaction is no longer monitored for changes in performance levels based on those thresholds.

If SLA monitoring is disabled for an application, you cannot enable SLA monitoring of its transactions.

Enable or disable monitoring of a specific transaction

In the Threshold Settings table, click the **On** or **Off** icon in the row for the performance threshold.

Enable or disable monitoring of all transactions

On the Threshold Settings toolbar, click **Monitor All** or **Unmonitor All**.

Set Thresholds

The threshold value determines the performance level that triggers a change in the state of a transaction or application. For each transaction, you can define thresholds for latency and errors. You can set threshold values or have AppSpeed calculate values based on performance trends over time.

Define Thresholds

You can set the SLA thresholds for latency and errors for a specific transaction.

Manually define thresholds

1 On the Threshold Settings page for the application, select the row for the performance threshold.

   The threshold settings are shown in the Threshold pane below the table. The transaction's performance relative to the thresholds is indicated on the accompanying graph. The thresholds are indicated by color-coded lines. A black line indicates the performance trend for the defined time frame.

2 Type the threshold value in the appropriate state text box.

   When the threshold value is exceeded, the transaction status changes to the selected state.

   The threshold line on the graph is adjusted according to your setting so that you can view the performance data relative to the proposed threshold.

3 (Optional) Click **Revert** to revert to the previous saved values.

4 When you finish setting the thresholds, click **Update Table**.

   The values are updated in the Threshold Settings table.

5 Click **Apply Changes** to accept the changes.

Use AppSpeed Threshold Suggestions

You can use suggested threshold values. AppSpeed calculates these threshold values based on performance trends over time. AppSpeed can calculate values for all thresholds for all application transactions or only for those thresholds for which no values exist.

If you use the suggested threshold settings for all transactions, you can still disable monitoring for specific transactions. You can also edit values for a specific transaction, as described in "Define Thresholds" on page 35.

Implement AppSpeed suggested values for all thresholds

1   On the Threshold Settings page for the application, click 🐼 **Suggest for All** on the toolbar.

A progress bar appears while the process is performed, which might take several minutes.

When the process is complete, the calculated values overwrite any previously set values in the Threshold Settings table. A flag icon next to the transaction name indicates that it is overwritten but not yet applied.

2   (Optional) Click **Revert All** to revert to the previously saved values.

3   To edit a value for a specific transaction, select the row for the performance threshold and edit the value in the appropriate state text box.

4   Click **Apply Changes** to the save the values in the Threshold Settings table. The flag icon disappears.

Implement AppSpeed suggested values for undefined thresholds

1   On the Threshold Settings page for the application, click 🐼 **Suggest for Undefined** on the toolbar.

A progress bar appears while the process is performed, which might take several minutes.

When the process is complete, the calculated values overwrite any previously set values in the Threshold Settings table. A flag icon next to the transaction name indicates that it is overwritten but not yet applied.

2   (Optional) Click **Revert All** to revert to the previously saved values.

3   To edit a calculated value for a specific transaction, select the row for the performance threshold and edit the value in the appropriate state text box.

4   Click **Apply Changes** to save the values in the Threshold Settings table.

The flag icon disappears.

Configuring Email Notifications

You can configure AppSpeed to send email notifications regarding events to one or more email addresses. An email notification includes a one-line summary of each generated event. The notification settings are configured globally and are identical for all monitored applications.

Configure email notifications

1   Click the **Administration** tab, and in the Management Tools pane click **Mail Notification Settings**.

2   Select the **Send mail notifications for events** check box.

3   In the **Recipient addresses** text box, type the email address to which to send notifications and click **Add**.

You can add additional email addresses as needed.

4   In the **SMTP server** section, select how to route email messages.

5   (Optional) If you select **Forward all mails to the following smart host**, enter the address of the smart host in the adjacent text box.

6   In the **Outgoing Mail Definitions** section, configure the following parameters:

- **Sender Account**: The email account from which event notification messages are to be sent.

- **Mail Subject**: The subject text to appear in event notifications.

- **Interval between Mails**: The interval, in seconds, between sending the event notifications. During the interval, event notifications are accumulated and then sent as a single email notification.

7   In the DNS Server section, type the preferred and alternative DNS server details in the respective text boxes or select the **Acquire Automatically** check box.

8   (Optional) Click **Send test mail** to verify the accuracy of the email addresses.

9   Click **Apply**.

Remove an email address from the notifications list

1   In the Management Tools pane of the Administration module, click **Mail Notification Settings**.

2   In the **Recipient addresses** list, select the email address to remove and click **Remove**.

3   Click **Apply**.

Enable or Disable Event Notifications

Disabling event notifications allows you to suspend email notifications, without affecting the notification configuration settings.

Enable or disable notifications

1   In the Management Tools pane of the Administration module, click **Mail Notification Settings**.

2   Select or deselect the **Send mail notifications for events** check box and click **Apply**.

Viewing Events

The Events List includes the events generated in the specified time frame. Table 5-1 describes the parameters included in the Events List.

Table 5-1. Event List Parameters

Parameter	Description
ID	Event ID
Time	Time when the event was generated
Type	Type of object for which the event was generated (transaction or application)
Name	Name of the object for which the event was generated
Event Type	Type of event: Latency or Error percentage
From State	State of the object before the event was generated
To State	Updated state of the object for which the event was generated.

When **Applications and Servers** is selected in the Inventory tree, only application events are displayed in the Events List tab.

View Events List

There are a number of ways you can navigate the Events list.

Viewing Events

- To view the events for a specific application, select the application on the AppSpeed Inventory tree and click **Events** on the page selection bar.

- To move forward or backward within the specified time frame, click **Next Day** or **Previous Day**, respectively.

- To hide transaction-specific events, deselect the **Show Transactions** check box.

- To display the transaction-specific events, select the **Show Transactions** check box.

- To view events for each transaction, select the transaction in an Application view and click **Events** on the page selection bar.

View Event Details

You can view the details of a single event, including the key performance indicators of the object for which the event was generated. This information includes the time when the event occurred and performance indicators.

For a description of the performance indicators, see "Performance Indicators" on page 16.

View event details

On the Events List page, double-click the event.

When applicable, links to calculated actions appear in the Next Steps pane.

Delete Events

You can delete events from the Events List at any time.

Delete events

On the Events List page, select the events and click **Delete**.

Troubleshooting Errors While Using AppSpeed

6

If you encounter problems when you use AppSpeed, use this troubleshooting information resolve the problem.

Virtual Machine is Not Visible in the Inventory

Problem

A virtual machine is not in the AppSpeed Inventory tree.

Cause

The virtual machine is not mapped because of low traffic volume.

Solution

1   In the Analysis module, select **Applications and Servers** in the Inventory tree.

2   Click **Unmapped Traffic** on the page selection bar.

3   Click the **Servers** tab and search for the virtual machine.

    A low number of hits indicates that the virtual machine is not yet mapped.

Cause

The virtual machine is not displayed because SSL private keys need to be loaded.

Solution

1   In the user interface, select **SSL Management** in the Administration module and verify that the server appears on the list.

2   If the server is on the list, load the corresponding private keys.

    See "Managing SSL Keys" on page 29.

Application is Not Visible in the AppSpeed User Interface

Problem

The application does not appear in the AppSpeed user interface.

Solution

1   In the Analysis module, select **Applications and Servers** in the Inventory tree.

2   Select **Unmapped Traffic** on the page selection bar.

3   Click the **Servers** tab and search for the server that runs the application under the relevant protocol.

    A low number of hits indicates that the application is not yet mapped. In the **Transactions** tab, you can see the transactions that are not mapped to an application because of a low number of hits.

4   If the server is not discovered, verify that an AppSpeed probe is running and connected to the same vSwitch that the server uses for traffic handling.

AppSpeed Probe Deployment Shows In Progress But Deployment Failed

Problem

The AppSpeed deployment status bar displays **In Progress** when deployment fails.

Cause

A storage problem, such as long latencies or outages, prevents communication with AppSpeed.

Solution

1   If the vSphere Client returns the `Unable to access file` error, use the AppSpeed interface to delete the probe.

2   Verify that the storage problems do not recur or select different storage and redeploy the probes.

For detailed instructions about deleting and redeploying a probe, see "Delete Probes" on page 29. For more assistance with troubleshooting storage problems, contact your storage vendor.

A linked clone might remain visible in the inventory after probes are deleted. It will be removed when a new deployment is initiated.

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